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vortex would alternately approach to, and recede from, the ground, and hence, possibly, the series of points of excessive destruction observed in the track of the late tornado.

Mr. J. H. Abbot thought, that, instead of air descending from above, the rarefied air in the centre of the vortex would ascend, in consequence of its diminished specific gravity; and in proof of the existence of strong ascending currents of air within and above cumulus clouds, he referred to the fact that a dog connected with a parachute, having been dropped from a balloon by M. Blanchard in 1787, was borne above the clouds by a whirlwind, and there sustained till Blanchard had descended almost near enough to take it into the car again!

The further discussion of the subject was postponed till the next monthly meeting.

Three hundred and fifty-fourth meeting.

December 3, 1851. — ADJOURNED QUARTERLY MEETING.

The PRESIDENT in the chair.

Professor Peirce, in behalf of the committee appointed to consider the arrangement into classes, and the restriction of the numbers, of the Fellows and Members of the Academy, presented the following report: —

“ The present number of the Fellows and Members of the Academy is about two hundred and eighty, of whom one hundred and thirty are inhabitants of Massachusetts, about eighty reside in other portions of the United States, and about seventy are Foreign Honorary Members. They are quite unsystematically and disproportionately distributed through the various departments of science, and they have not, apparently, been selected in all cases with sufficient regard to legitimate scientific claims. The committee are of opinion, that the true remedy of this difficulty consists in the proper limitation of the number of members. For when nominations are exclusively to vacancies, and the election of one member prevents, at least temporarily, that of opposing candidates, a strong interest will be excited in the society to enroll upon their list the worthiest names, and obtain for the Academy a higher reputation for sound judgment in this respect.

"In order to give a general basis for the equal distribution of members, and prevent the collision of claims too remote for comparative measurement, a proposition is offered for limiting the number of members in the several departments of learning. It is not, however, proposed to render this limitation so minute and special in its character, as to embarrass the action of the Academy, and clog the freedom of selection by an unyielding chain of details. But it is thought, that, if a classified list of all the members is constantly kept, in which they are arranged under the special sciences to which they are devoted, it will prove to be a judicious restraint in the choice of candidates, and an effectual safeguard against their unequal distribution in the different departments.

"The views of the committee are definitely embodied in the following proposed additions to Chapter VII. of the Statutes, the title of which shall be, 'Of Fellows and Foreign Honorary Members.' It will be observed that no provision is made for limiting the number of Fellows resident in Massachusetts, because it is already provided by the charter that this number shall not be less than forty, nor exceed two hundred.

"'2 a. Fellows residing out of the State of Massachusetts shall be known and distinguished as Associate Fellows. Associate Fellows shall not be liable to the payment of any fees or annual dues, and shall not vote at meetings of the Academy, but on removing within the State, shall be admitted to the privileges, and subject to the obligations, of Resident Fellows.'

"'2 b. The nomination and election of Associate Fellows shall take place in the manner and under the conditions prescribed in the first article, for Resident Fellows; and moreover, each nomination shall be publicly read and referred to the Council designated in the third article, at a statute meeting previous to that of the election; and a written approval, authorized at a meeting of said Council by a vote of a majority of its members then present, signed by at least *seven* of said Council-lors, and read at the time of the election, shall be requisite to entitle the candidate to be balloted for. The Council may, in like manner, originate nominations of Associate Fellows, which must be read at a statute meeting previous to that of the election, and exposed upon the nomination list during the interval.'

"'4. The number of Foreign Honorary Members shall not exceed *seventy-five*, and they shall be chosen from among those most eminent

in foreign countries for their discoveries and attainments in either of the three great departments of knowledge, viz.: — 1st. The Mathematical and Physical Sciences; 2d. The Natural and Physiological Sciences; 3d. The Moral and Political Sciences. And there shall not be more than *thirty* members in either of these three departments.'

" 5. The number of Associate Fellows shall not exceed *one hundred*, of whom there shall not be more than *forty* in either of the three departments of knowledge designated in the fourth article.'

" 6. It shall be the duty of the Council designated in the third article to nominate, on due consideration, at meetings convened for the purpose, and as vacancies occur, the most suitable candidates for Foreign Honorary Members, to prepare and keep a list of the Fellows, of the Associate Fellows, and of the Foreign Honorary Members, classified according to the general departments of knowledge indicated in the fourth article, and arranged in subdivisions in respect to the special sciences in which they are severally proficient. It shall also be the duty of the Council to exercise a discreet supervision over all the nominations and elections, and to exert their influence to obtain and preserve a due proportion in the number of Fellows and Members in each of the special subdivisions."

The committee also recommended the adoption of the following votes: —

" *Voted*, That the Council be, and hereby are, directed to report to the next statute meeting of the Academy a list of all the actual Fellows and Members, arranged in the following divisions, with a statement of the number of each division.

" FIRST CLASS. — MATHEMATICAL AND PHYSICAL SCIENCES.

First Division. Mathematics.

Second Division. Practical Astronomy and Geology.

Third Division. Physics and Chemistry.

Fourth Division. Technology and Engineering.

" SECOND CLASS. — NATURAL AND PHYSIOLOGICAL SCIENCES.

First Division. Geology, Mineralogy, and Physics of the Globe.

Second Division. Botany and Vegetable Physiology.

Third Division. Zoölogy and Animal Physiology.

Fourth Division. * Medicine and Surgery.

"THIRD CLASS.—MORAL AND POLITICAL SCIENCES.

First Division. Moral and Intellectual Philosophy.

Second Division. Philology and Ethnology.

Third Division. Politics, Political Economy, and Jurisprudence.

Fourth Division. *Æsthetics.*"

"*Voted,* That the Secretaries be authorized and directed to cause to be prepared a suitable diploma or form of notification of election for the Foreign Honorary Members."

Dr. B. A. Gould, Jr. presented to the Academy, in behalf of its author, a volume entitled "The Exposition of 1851, or Views of the Industry, Science, and Government of England, by Charles Babbage, Esq.," and called attention to a new and uniform system of lighthouse signals, recommended by Mr. Babbage for universal adoption.

Three hundred and fifty-fifth meeting.

January 6th, 1852,—MONTHLY MEETING.

The PRESIDENT in the chair.

Professor Peirce, in behalf of the committee to whom was referred Lieutenant C. H. Davis's paper on the subject of the deterioration of Boston harbor, read the following report:—

"The committee to whom was referred the memoir of Lieutenant C. H. Davis upon the state of Boston harbor, have examined the same, and ask leave respectfully to report, that the memoir contains an enumeration of several changes that appear, by a comparison of the charts made at various times, and by other evidence, to have taken place in some of the most important channels of the upper harbor. This part of the memoir embraces a subject entirely local in its character; yet its importance, as affecting the prosperity of a great maritime city, our birthplace and home, may well compensate for the absence of that general interest which belongs to many other subjects of our transactions. The memoir, furthermore, contains an examination of the various causes by which the changes of the harbor have been brought about, influenced, or modified, and by which further changes may be produced. These causes are intimately connected with those general hydraulic forces which are at work wherever tides and streams